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WIDEST SENSE

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## AMERICAN JOURNAL OF PHOTOGRAPHY. APRIL, 1897.



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## AMERICAN JOURNAL

OF

# PHOTOGRAPHY

THOS. H. McCOLLIN, Managing Editor.

JOHN BARTLETT, Editor.

VOL. XVIII.

APRIL, 1897.

No. 208.

#### ANNOUNCEMENT.

WITH the present issue of this magazine, John Bartlett renews his connection as editor, and in the exercise of the function trusts he may receive, as in former days, the same aid and encouragement to make the AMERICAN JOURNAL OF PHOTOGRAPHY the instrument of much usefulness to all interested in the delightful art of photography.

Though rapid advance has been made of late years towards the perfection of the practical operations of photography, must we not confess, despite the labors of the eminent scientific men of the profession, how narrow still is the horizon of our knowledge of the rationale of photographic phenomena?

Much valuable elucidation of the chemical problems involved has been brought forth, which, however, properly belongs to the domain of chemistry, but how great are the controversies and how varied the opinions when the question of physical causes comes up for discussion. To instance a case: is there any unanimity of views on the cause of blurring of the image? It is usually ascribed to geometric reflection of the incident rays coming through the lens from the back surface of the glass. The phenomenon requires a more comprehensive explanation. The blurring caused by a dark object projected against a light ground, as the sky, for instance, the most intense presentation of the phenomena, can hardly be explained by reflection of incident-rays from the back of the glass, and so we say that this kind of blur-

ring is due to reflection from the minute grains which constitute the structure of the sensitive film without making any attempt to substantiate our views by experimental evidence; and finally, how are we to explain the blurring arising when fine lines close together are photographed?

And so one might cite the lack of agreement in the theories of color sensitiveness and optical sensitisers in orthochromatic photography, to say nothing of the doctrine of the nature of the latent image.

If it be true that the beginning of an acquaintance, whether with persons or things, is to get a definite outline for our ignorance, we think we may safely congratulate ourselves that we have reached this stage of our progress in the philosophy of photography.

So far as our experience has hitherto gone every advance towards generality has at the same time been a step towards simplification, and truly it is, as Herschell has said, only when we are wandering and lost in the mazes of particulars, or entangled in fruitless attempts to work our way downward in the thorny paths of applications to which our reasoning powers are incompetent, that nature appears complicated. The moment we contemplate it as it is, and attain a position from which we can take a survey, even though it be a confined one, we shall recognize that simplicity of things which gives our minds the satisfaction that the truth at last has been attained.

The honest manner with which M. Chassagne has conducted his exhibition of color results has enlisted many in his favor, not-withstanding his pictures are not everything which one would desire in a transcript from nature. As the editor of the *British Journal of Photography* truly remarks, it is hardly just to make comparisons with Mr. Bennetto's photographs, as the work of 'nis gentleman is in the form of transparencies and lantern slides, a variety of positive in which the distribution of light and shade and of color must necessarily be much better rendered than in a print upon an opaque support. But this latter variety of photograph is really the only one which can practically present the colored picture. Mr. Ives' superb renditions of color by his Chromo-

scope have as yet not been equaled by anyone. But even his achievements, notwithstanding the deserved applause they have received, are not photographs in natural colors, in the proper acceptation of the term, but a most ingenious elaboration of a preconceived theory of color sensation.

EVERYTHING connected with the X-rays is regarded with interest. We know how some months ago Edison delighted us with the prospect that the rays might be made instrumental in giving the blind the power to distinguish objects, but nothing developed. In a paper, published in the Photographisches Archiv, Czermat discusses the possibility of the achievement. The first point to determine is whether the retina is sensitive to the Roentgen rays inasmuch as they pertain to the invisible, though it has been claimed that some eyes are capable of appreciating them, especially in the case of persons who have had the lens of the eye removed in the operation for cataract. Like other substances, the lens is found to be fluorescent and so absorbs the greater part of the rays, and supposing the nerve fibres of the retina to be intact, the doctor thinks there is no reason to doubt but that the impression might be cognized. Notwithstanding the abundant radiation of the light it is but very sparsely, if at all, reflected from objects, only metals having shown a slight amount of weak, diffuse reflection.

In order to visually perceive a body, not only is reflection from it necessary, but also the light must be refracted through the lens to make a more or less distinct reproduction of the image on the retina. Now it is known that the X-rays have not as yet suffered refraction by any method. We can hardly regard the apparent traces of refraction through metals. But the Doctor calls to mind that photographs have been produced without a lens, that is, by the pinhole camera, so he proposes to employ such an instrument to project the Roentgen rays, making use of a disk of lead pierced with a small opening, and covered with an aluminum or black paper plate so as to effectually exclude all ordinary light. With such an apparatus Czermat has produced in this manner photographs of a small steel object placed very close to the Crookes' tube, and concludes that the blind might be made to see

such objects if provided with pinhole camera spectacles. But we hardly think that the blind will greatly rejoice over the prospect of such quasi vision.

J. REES, in the *British Journal*, does certainly strike a note which is in accord with every sensible person's opinion, and his paper may be read with much profit by the professional photographer who is lamenting the small profits and the apathy of the general public for artistic productions.

We never look at the displays in the cases of our leading professional photographers, or, for that matter, at our exhibitions without sighing, oh that the professional might return to simple themes simply rendered and not struggle so after the grandiose and ridiculous. As we have frequently said, the scenes and incidents of domestic life present a rich and tempting field for the exercise of true artistic feeling, and would form a more profitable and at the same time delightful province than in the taking of celebrities, or agonistics, in all the various modes of bizarre and wierd illumination. We have heard many express, not only their disappointment, but evident dissatisfaction, if not disgust, at the deception, as they called it, of the photographer who displays an alluring phalanx of theatrical beauties at his front door, and the aspirant after novelty can hardly repress chagrin at the sight of the tame looking proof.

Why not follow the excellent advice of Mr. Rees, and strive to educate the people to the proper appreciation of the beauty of a natural pose. In fact the people hardly need any education in this direction; they are already turning away in disgust, to the depletion of the exchequer of the professional. Shop accessories and artificial backgrounds which are generally out of harmony with the subject, no matter how artistic in themselves, can never give the pleasure of home-like surroundings.

The amateur is wiser here in his generation than the children of light. The professional, with his acquired skill, might soon draw all the tide in his direction, for the people are appreciative of technical excellence but they prefer the taste of the amateur even associated with bad technique.

#### PHOTOGRAPHING LACE.

JOSEPH PERRY, JR.

O N reading the above title, the portrait photographer might be inclined to think it unnecessary to furnish special instructions for photographing material so easy of representation. The head when crowned with its setting of lace is not only more beautiful as a picture, but the lace itself is an accessory very helpful in illumination, and offers no difficulties in the development in relation to the flesh tints. But the writer has not reference to the photography of this fabric when forming part of a lady's apparel, where a broad general effect is desired and the lace becomes only the point of accentuation in the picture, contrasting with the deeper tones, and where the representation of excessive minutiæ would detract rather than add to the artistic value of the photograph.

Recently the writer was called upon to photograph a number of patterns of beautiful samples of lace for an importer, who was anxious to secure the finest and most accurate representation of the originals to serve as specimens for selection by his customers all over the country; and as they would be examined in a very critical manner, more for their technical beauty than artistic, he was very anxious that they should set forth their peculiar virtues in the photograph.

He had tried a number of photographers whose specialty was commercial work, but had found them all wanting. They protested that the work was as good as the camera was capable of doing, and referred him to the decision of fellow-photographers, who acquiesced in the opinion. He paid the bill for the work but refused to be satisfied as to the limitations of the art; maintaining that the colors being such as offered no difficulty, the photograph, if properly made, ought to give exactly the character of the lace as presented to the eye. He finally was about to give up in despair, and to content himself with the more expensive method of the draughtsman and duplication of the drawings by photography. We asked him to let us try our hand at the work,

although we confess we had but little expectation of producing any better work than the professionals, being one of those muchpitied amateurs, but with the characteristic amateur assurance we ventured upon the task.

After feasting our eyes upon the delicate tracery of white upon white, the fine structure of the meshes, all of which he demanded in the photograph, we felt our fears "like a tempestuous ocean rise" that we had undertaken a rather difficult job. We had not calculated on the conditions demanded by the subject. White upon white! how should it be rendered to give any idea of "plasticity" (that is hardly the proper word), we mean, anyhow, relief.

Each mesh of the lace consisted of cylindrical threads lying very close together. Now, we thought, if each of these threads is to be represented in the picture, it is necessary that they be distinguished from each other by light and shade. So the problem resolved itself to conditions of proper illumination.

If the lace patterns so constructed are photographed in full, broad light, they must of necessity be uniformly illuminated. The threads on the left\*will receive just as much light as those on the right, and hence all the cast shadows will be destroyed. There will be no relief. The threads will form homogeneous white lines which will coalesce to form a monotonous white surface.

I remember some previous experience which ought not to be expected of the professionals, and is therefore in justification of their failure. I had had considerable experience in microscopic photography where I encountered almost identical subjects, in which the character of the illumination, the angle of light, entirely altered the appearance of the objects.

In determining the structure of minute forms of life, or death either, the microscopist is often puzzled to determine the actual structure. For instance, to be brief, some of the diatoms magnified up to 900 diameters exhibit a beaded appearance which might be regarded as the real structure, as indeed it was so regarded for a long time, but this appearance was only an optical illusion produced by the illumination. The real structure, under

illumination, showed as a network of hexagons instead of a surface of regularly arranged rows of hemispherical beads. The high tricks of illumination are indeed enough to make the photographer weep. So, remembering this fact, I arranged my specimens on a copying board and placed it upright, and made my room rather dark, or rather, to speak more correctly, greatly subdued the illumination.

The light came in from a narrow opening in the shutters and was considerably to the side; the slit being about  $2\frac{1}{2}$  inches wide, the board with the lace on it, at a distance of about 4 inches.

Even to the vision the effect of relief was plainly visible. Each individual thread was distinctly lined out most charmingly and the picture had the appearance of the most delicate tracery in marble.

The patterns were made as near actual size as possible, and the exposure of ten seconds, with a stop just large enough to give all the fine detail accurately. Of course, desiring vigor and contrast, all over-exposure must be avoided; the prolonged exposure in the case being due to the subdued illumination. In each case a trial plate can be readily made.

If too much relief is given to the pattern, which may happen, as it did to me, increase the mouth of the opening, and of course shorten the exposure. The development needs no special instructions except that in aiming for contrast do not overdo the matter by making the negative too harsh, remembering that the softness of the lace demands its consideration, and so keep from an excess of pyro—but here also a test plate will serve as a guide.

These few remarks, which I hope the professional will take in good part, for I have no desire to instruct, may be of service also in the photography of plaster busts and reliefs, or, as I also employed it, for photographing antique vases and coins. Such subjects, if taken in too broad a light, have all the plasticity taken out of them. Of course, larger objects, like plaster busts or statuettes, demand more illumination than the lace work.

Employ a light coming from an opening of about a yard wide and high, placing the casts and smaller statuettes about a yard distance from the source of illumination, the larger somewhat further off, and do not lighten up the shadows too much with reflectors, as this in itself will destroy the relief so much to be desired. And, I was about to say, snow scenes might be included in the list, but though kindred, being white on white, we are compelled to take what illumination we get and make the best of it. However, in some cases it may be possible, and we can, at least, avoid a flat light illuminating the subject directly in front. In ice sculpturings and masses of snow, some very beautiful effects of white upon white with lovely contrasts can be had by taking advantage of the direction of illumination, but in all snow and ice pictures the illumination even under the most favorable conditions is rather excessive, and there is a danger of halation from the brilliancy of one portion against the other parts which are only a few degrees below in intensity. When the sun is partially veiled behind clouds and lights up the masses somewhat laterally most charming pictures are secured. But this has not much to do with the photographing of lace samples, about which I was only to speak, so begging your pardon, I subside.

To the Editor :-

Acting on your suggestion I tried the Benzoate of Ammonia with Chloride of Gold for toning matt surface and glossy prints. I slightly altered your formula, however, making up the following:

The tone is a rich violet-black, which is pleasing but not very like platinum tone. Did your readers ever try making matt surface prints on the reverse side of the old-fashioned albumen paper. It is not any newer than the benzoate of ammonia toning, but gives pretty results, nearer platinum effect, and if the prints are mounted on plate mounts, the resemblance is still closer; but nothing equals platinum for softness of finish and refined delicacy of tone. To make the matt prints on the albumen paper float the back, not the albumen side, with a rather strong silver solution (60 grains to the ounce) and float a little longer than usual, for it is necessary the silver should penetrate to the albumen; dry, and print as usual, and tone with gold and phosphate of soda or carbonate of lime.

Gerald Exton.

# CONCERNING THE REPRESENTATION OF MOTION IN PHOTOGRAPHY.\*

JOHN BARTLETT.

In the delineation of the forms of nature the human eye, guided by the most delicate touch, cannot approach the accuracy of the pencil of light, and photography has led us, directly or indirectly, to a perception of many of nature's latent beauties and many of her appearances which the unassisted vision might not recognize as beauties, but for the camera's searching glance; yet from the tribunal of art judgment must often be pronounced against photography, and the book of the law is the limitation of our vision.



PETER'S REBUKE -Anabale.

Upon this physiological peculiarity of the eye, not to see nature as she actually is -this optical imperfection, if we venture to call it-as compared with the lens of glass, depends much of our æsthetic pleasure. It has been shown that in the rendering of light and shade there is a difference between the photograph and the painting. in which method of the painter is to be justified rather than the photographer's, although the painter takes greater liberties, so to say, with nature.

How often do we hear it said: "A photograph cannot

lie," but like Macbeth's witches, it sometimes "lies like truth."

A representation of nature, to be true artistically, must be

<sup>\*</sup> Read before the Photographic Society of Philadelphia, March 10th, 1897.

true in relative values of light and shade, as well as true in drawing, but in relative tone the photograph is often very wrong.

The variety of shades of color in objects, and the effects produced by reflection and interpenetration of colors are heightened by persistence of vision which would be counted a defect in photographic practice, creating havoc with the impression on the sensitive plate.

It has been clearly demonstrated that the image impressed upon the retina remains there an appreciable space of time. It is not instantaneously formed and then completely obliterated, but during its transit allows the superposition of other impressions following quickly, so that a sort of composite image is formed. It is this peculiarity which enables us to enjoy the Vitascope, and other optical wonders.



PETER MARTYR .- Titian.

To compel the painter to represent arrested motion—an actual momentary attitude—because he has to do with a single moment of time in his representation, would be about as wise as o force him to confine himself to the use of those colors only which do not harmoniously modify each other when in juxtaposition, though science proves the isolated extence of the three primary colors in the spectrum in their integrity.

Objects, though passing continuously through an unbroken series, seem to the eye to have no breaks in the suc-

cesssion, hence the idea of motion; but instantaneous photography, by isolating any special movement in the series, really destroys the whole idea or conception of motion. Hence art never does and never has painted animals or men in the attitudes Muybridge and the rest have shown by photography to be the actual, true positions.

The few instances in the history of art of examples apparently conformable to these demonstrations only prove that sculptors were not entirely ignorant of some of the real attitudes of the horse in motion, but were conscious that art is governed by visual laws which demand a different treatment, and that taste tolerates conventionalities rather than radical representations.

Lessing, the great German critic, in his essay entitled "The Laocoön; or, the Limits of Painting and Poetry," tells us:

"All appearances of nature which in their actual state are but of an instant's duration—which can be what they are but for a moment—all such appearances, be they pleasing or be they hor-



HELIODORUS .- Raphael.

rible, receive through the prolonged existence which art gives them, a character so contrary to nature that at every repeated view we take of them the impression becomes weaker and weaker, till at last we turn from the contemplation in weariness and disgust.

"La Mettrie, who had himself painted and en-

graved as Democritus, the laughing philosopher, laughs only at the first time we look at him. Look at him often and the philosopher is converted into a buffoon, and his laugh into a grimace."

We all feel how disagreeable an unmeaning laugh is in society, and in a portrait unconnected with story or incident, it becomes unmeaning or worse, especially when the face is made to look at us.

In the wonderful group of "The Laocoön," the father and his sons are being crushed to death by huge serpents, but the sculptor does not seek to represent in the countenance



SOLDIERS BATHING IN THE ARNO Michael Angelo.

of the sufferers the distortion which would actually accompany the physical and mental anguish, but the spirit of a great, self-collected soul is portrayed. The beholder is rather led to the contemplation of the extreme expected, than actually sees it, with that appear-

ance with which we do not associate the idea of transitoriness, so inseparably as to be displeased by its continuation in art. In other words, that which is beautiful in a work of art, is beautiful, not to the vision as a single isolated phase of a continuous action made forever unchangeable, but as it is suggestive of succeeding phases, stimulating the imagination to create for itself something which is not actually presented to the eyes, but effected through their means. The mind thus anticipates, carries itself beyond, what could have been actually represented at the precise moment the scene depicts, and its delight is thereby increased.

"In scorn of nature art gives lifeless life."

It is not pretended that photography aspires to enter the province of imaginative art, but its inability does not debar it altogether from producing pictures which may stimulate the mind to create something for itself, which is not actually before the eyes in the theme represented. That is, it may in a measure be suggestive, and bear strong marks of the individuality of its author—of the permanent personality of the artist—and of the more or less accidental impression produced upon him by the sight of the object rendered.

One of the methods of rendering a photographic picture suggestive is dependent upon the manner in which the idea of motion is conveyed—in which instantaneity has no part or lot. By its scrupulous adherence to reality it takes away the very

appearance of reality, *motion*, *life*, *action*; because it represents the object, as it were, petrified in the transient state—fixed constantly in a position which could not be preserved for more than a single moment without pain.

How insupportable do those statues of heroes become as we behold them upon their solitary pedestals with arms extended, forever holding that uplifted sword. We look for some indication of what has immediately gone before, and also something of what is about to follow. It is only thus that a figure in motion can have full truth and power of expression. The artist, painter or photographer, must ignore in some measure, the extremely narrow limits of the single attitude.

This lack of the impression of a continuity of movement is particularly felt when viewing some of our statues of military beroes.

In a photograph of a group by Paul Baudry, intended for the decoration of the foyer of the Paris Opera House, notwithstanding the violent simulation of motion in outstretched legs and arms, there is conveyed only the impression of an unpleasant mobility. It is a representation of purely arrested motion, there is no coördination to a general movement, which the mind itself should supply. All the movements do not lead to the idea of one impression.

But let us place, for instance, the same single figure of a military hero with uplifted sword and his steed with elevated legs, in fact, in the precise sculptured attitude, in a painting, marching at the head of a victorious host with streaming banners, and the mind has something to turn to for relief to refer the attitude of violent motion, and the impression is strong and full of enjoyment.

The greatest painters have devoted their attention to this imitation of motion in their paintings. Rubens is remarkable for the wonderful expression of action he gives to his figures. Fuseli describes the elements of his pictures as "Swept along in a gulf of colors, as herbage, trees, and shrubs are whirled, tossed and absorbed by an inundation." There is a picture of his rep-

resenting a rustic wedding, filled with figures dancing, romping, and rolling on the ground: a wonderful display of varied attitudes, which creates in the beholder the idea of motion in a masterly manner. Indeed it might be said that the greatness of a painter can be determined by a study of his method of dealing with motion.

Constantine, in his work on the Itanan Painters, has remarked that "therapidity and suddenness of movement on the part of the mother of the demoniac boy in Raphael's picture of the 'Transfiguration' is such that the draperies have not had time to follow the impulse of the body. She alone has turned. Her girdle, left behind by her movement, seems to be placed awry, but we soon perceive that if she were to return to her former attitude it would be in its proper place. Raphael always leaves around his figures the space necessary to indicate the position in which they were at the moment immediately preceding that chosen for the painting, and is very careful not to fill up the void which they have just left behind them."

We see here how Raphael succeeded in giving to his figures that spontaneity of movement and true and serious grace which leaves an impression so powerful upon intelligent and sensitive minds. Instances may likewise be selected from the works of Titian, the great Venetian painter, in which the expression of motion and animation is portrayed in a wonderful manner. In a small picture representing Christ appearing to Mary in the garden, the Magdalene seems fairly to run forward to meet the Lord, her streaming hair and drapery denoting the utmost rapidity of her action, while the hand stretched forth to touch him is suddenly checked at his words, "Touch me not."

Michael Angelo is also rich in illustration of the power of conveying the idea of motion by suggestion, though he, sometimes, transcends the limits of the ideal in his excessive predilection for representing violent attitudes.

Charles Leslie has called attention to a peculiar conception of Angelo's 'Judith and Holofernes." The headless man turns on his couch, and the rustling of the curtains occasioned by the up-

raised and moving arm, causes Judith, who has just escaped, to look back. Thus the terror of the scene is indescribably heightened by an attention to the fact of the continuation of muscular motion, for a short instant, after decapitation.

Even among the best of the minor painters we often find the previous position of the figures indicated by the manner in which the apparel is disposed upon the ground or upon some near object.

A picture can no more place itself in antagonism to the physiological nature of the eye than music to the ear—and phographers should imitate the painters, if desirous of conveying the idea of motion, and not seek for action in transient attitude. A transient attitude may indeed be depicted but not isolated. There should always be other objects associated to carry the mind from one phase to the other so that it weary not of the perpetual sameness.

Surely it is not impossible for the photographer to imitate the painter, and leave around his figures the space necessary to indicate the position in which they were at the moment immediately preceding that chosen for representation, instead of scrupulously filling up the void which they have left behind them, for fear of an hiatus. We might thus give an intensity and energy of action to our picture which an isolated figure would find very difficult if not impossible to support.

Our figures should be surrounded by that which is needed to explain them and to show their connection with the rest of the work.

We have seen many a photographic picture which suggested to our thoughts the beautiful lines of Keats:

"Fair youth! beneath the trees, thou canst not leave
Thy song, nor ever can those trees be bare;
Bold lover, never, never canst thou kiss,
Though winning near the goal; yet do not grieve;
She canot fade, though thou hast not thy bliss,
Forever wilt thou love, and she be fair."

Although the exercise of the imagination, the creative power of the poet and painter, is far beyond the highest aspiration of the photographer, yet the quality of suggestiveness may be found in a simple camera picture as the chief element of its attractiveness.

Photography, despite its intense realism, may tell a story in the drama of everyday life in such a way as to excite interest or sympathy. By proper selection and combination of actual facts, perhaps dull and prosaic enough, a mere photograph may give the mind material for the construction of a picture rich in thought and full of feeling.

When photography thus brings together objects stimulating the association of ideas and creating a mental picture, thereby producing sensations of surprise, novelty, and unexpectedness, it surely deserves to be admitted to the rank of a work of art.

Nothing in the whole range of art is perhaps so difficult to depict in their true relation as the sea and sky.

The harmony is so exquisite in the whole scale, from high to low, that the introduction of the slightest discordant element jars upon the feelings of those whose souls are tuned to its concord.

The sea, infinite in variety of changing forms and hues, unwearied in its manifestations of grace, unconquerable in power and majesty, eludes the subtle touch of the most skillful painter to catch one phase of its lovely inconstancy, any one form of its fury. Even in its gentler moods, when with soft murmurings it sports with the beached margin of the shore, so mockingly transient is the exquisite modeling of the little waves that the eye catches only furtive gleams of the beauty.

And so of the sky. The constant play of an exhaustless energy evolves from its bosom form after form of lovliness, fleecy masses of wind-fretted clouds, soft filaments of fine spun vapor interpenetrated with changing lights, multitudes of dense white shapes, wandering in thick flocks

"Shepherded by the slow, unwilling wind."

We think it may safely be said that photography has taught us more of the sea's phases and the sky's moods than centuries of observation.





We know full well the limitations of photography, and think we have honestly given utterance to its shortcomings in art, and we feel too the pre-eminence of painting; but let us candidly acknowledge the great service it has rendered to art by the treasuring up of those transient shapes of beauty which the pencil despairs of recording.



SKY PROSPECT.

The old masters, even the Venetian painters, who lived upon the very bosom of the ocean, give us only now and then crude little patches of green or blue, evidently intended for sea because they place little ships upon the patches as much as to say, "this is the sea." It was left to modern art, almost to the present century, to study the volume of the moving waters for its own beauty, and not as a mere conventional background for human motives. Turner and Stanfield come very near nature; they give the impression of mass and volubility, of transparency

and mobility. They show us the lapping and curling of the waves, with their lace-like traceries, the intermingling of light and shade broken up by the little surges and ripples, but even Turner fails to catch that perfect freedom in the flow, that rollick at the top of the wave when the spray seems hardly to know which to obey, the bidding of the wind or the impatient rush of the main wave trying to gain the shore. To judge from the average painting of sea and sky, what a vague idea people have of what a cloud or wave is like. A blot of white upon a scutcheon of uniform blue is passed off as the work of

"Heaven's profoundest azure,"

a rolling, twisting convolution of green with dabs and dashes of white passes current for the flow of old Ocean. These conventional ideas so blind us to the truth of clouds and waves, that when an artist who looks at nature with unfilmed eyes puts upon his canvas his perceptions, his picture is looked at askance and doubtingly.

And so when the camera gives us the sea and the sky with nature's own image and superscription, we fail to render tribute to whom tribute is due. Let us rather say with Wordsworth:

Praised be the Art whose subtle power could stay
Yon cloud, and fix it in that glorious shape;
Nor would permit the thin smoke to escape,
Nor those bright sunbeams to forsake the day;
Which stopped that band of travelers on their way,
Ere they were lost within the shady wood.
And showed the bark upon the glassy flood
Forever anchored in her sheltering bay.

Soul-soothing Art! which morning, noon-tide, even,
Do serve with all their changeful pageantry:
Thou, with ambition modest, yet sublime,
Here for the sight of mortal man hast given
To one brief moment caught from fleeting time
The appropriate calm of blest Eternity.



#### AMERICAN JOURNAL OF PHOTOGRAPHY.

APRIL, 1897.



INAUGURATION OF PRESIDENT MCKINLEY.

SNAP SHOT WITH NEW CARTRIDGE KODAK.

BY R. F. ENGLE, MT. HOLLY, N. J.

#### HINTS ON CARBON.

BY ERNEST HECKROTH.

THAT carbon prints have come to stay cannot be disputed. The excellence of this class of work has impressed the public very favorably; this is evident by the numerous exhibits of carbon work displayed, not only by our local first-class photographers, but by others all over the country; and now that it has gained such a firm foothold, it should not recede one whit from its present enviable position. There is, of course, a small percentage of people who, as soon as a thing becomes a little prominent, try to run it down; some of these "old fogies," who can find nothing worse against the carbon process, will say: "Oh! that's more than thirty years old;" but surely that is nothing to its discredit; it continually rises in public favor, and though it may have been laid aside at times for something newer, does it not look favorable to see people going back to it after having tried, and perhaps found wanting, these newer processes? It is a fact, and one to be regretted, that it is not more popular after its thirty odd years of existence. It did not reach the photographic arena at a single bound, as some of our high-gloss and "easy working" papers did, but in the end the carbon's absolute permanency, to say nothing of its general superiority, will gain for it a greater victory than the temporary popularity of the highgloss papers, which might appropriately be termed "magic" on account of the inexplicable fading away after a time of any photograph made on them. There is one thing which is to me a source of satisfaction, and that is that the "cheap shops" do not handle carbon prints; they may try by some little ruse to leave the public under the impression that they do, but it cannot be handled at "cheap rates," and the knowledge of that is enough to make those already interested, stick to it. One place I know of, has a sign out to this effect:

**CARBON** 

FINISH

and it is surprising to know how many see and make note of the word Carbon and never notice the word Finish. On examining the prints I found them to be of an entirely different make. It should not be surmised that the carbon's comparative obscurity is due to any lack of appreciation on the part of the art loving public; I believe much of the blame for this should rest with the workers of the art, they having failed to give it the prominence it justly deserves; however, I will admit that the old way of working, when one would have to make his own tissue, as well as the various supports, was rather disagreeable and troublesome, with rubber cement and heavy pressure for double transferring, not to speak of the many minor unpleasantnesses encountered; these were quite enough to make an ordinary person give it up in disgust. But now the process is so simplified that there is no excuse for leaving it in the background any longer; with the different supports and the tissue already supplied, and at a nominal figure, many of the difficulties are overcome, and it is no longer necessary that one should be a chemist, mechanic, and photographer to be quite expert in carbon printing. The production of ordinary prints on paper is not the limit to which this process can be put: the field open to those who have a knowledge of this interesting process is quite extensive, and it is with the idea of extending the acquaintance of those who have already made themselves familiar with the making of simple prints, that I will give a few hints and ideas, the execution of which should prove either interesting or profitable, or both. I will not go into details of sensitizing and developing, as that has been widely and thoroughly explained before, but will take it for granted that this much is understood. Positives on celluloid, glass or porcelain, whether they be for lantern slides, window transparencies, or porcelain prints, or if for reproducing purposes, are all made in very much the same manner. The tissue having been exposed for the proper length of time, is squeegeed face down on a glass without any coating or substratum, perfectly clean and free from grease of any kind, and placed between blotters and under pressure for about thirty minutes, and developed in the

same manner as for prints. There is, however, a difference in the time that the tissue should be exposed to get the best results with this variety of work. To make a print on porcelain, a negative should be selected with a little less contrast, and somewhat softer than what will make a good print on paper. The carbon tissue having been exposed for about the same time as an ordinary print, is squeegeed to the porcelain and developed until the high lights are clear when looking at the print by reflected light. This would, of course, give a reversed print, and should this not be desirable, the print instead of being developed on the porcelain may be developed on a glass and then backed with the porcelain, turning the glass with the print inside; this would be just the same as though it were on the porcelain and would show the print unreversed or correct. Another advantage in developing on the glass, is that if the print has been somewhat over-exposed, it could still be used for a transparency. The only difficulty would be in knowing how far to develope, which could be easily overcome by placing a white card or paper or the porcelain under the glass, when it will be readily seen just how far to go with the developing. Lantern slides are made in the same way as described above, but should be printed just a little longer than for prints, and should be developed until the high lights are just clear when looking at them by transmitted light. In making transparencies, if the regular tissue for prints is to be used, the negative should have a good amount of contrast, but if a transparency is to be made from a negative with not enough contrast, a special transparency tissue should be employed; the same may be said in regard to lantern slides. The blue, black and green tissue is the best to use for transparencies or lantern slides. The tissue should be exposed about twice as long as for prints, to yield a good transparency, and the developing should be stopped while the high lights are slightly veiled, just enough so as to show all the detail when looked at by transmitted light. If a good selection has been made you will have something for your trouble which will brighten an otherwise dreary window. The making of positives for reproducing purposes is but another instance where the admirable qualities of the carbon process can be used with advantage, owing to the absence of that grainy appearance so noticeable in dry plate reproductions. The mode of procedure is the same as for transparencies, with the exception that the tissue, which in this case should be the special transparency, owing to its finer grain, should be exposed a little longer, about three times as long as for prints. The developing should be checked while there is yet detail in the high lights and while it is strong enough for printing purposes. One more way of showing the beauty of carbon prints, and that will be enough, at least for a time-transferring to drawing paper. The drawing paper is first coated with the following gelatine emulsion: Take 2 ozs. of gelatine, which has been thoroughly swelled in cold water, and dissolve in 16 ozs. of warm; then add in a thin stream a solution of 1/2 dram chrome alum, dissolved in 6 ozs. of water, stirring the gelatine all the while and add enough acetic acid, also in a thin stream, to restore fluidity, whenever it shows signs of getting thick or ropey. Any number of sheets of paper may be coated with this and left to dry for future use, as it will keep indefinitely. Just before transferring, the drawing paper should be thoroughly soaked, as well as the prints, which should have been developed on a temporary, paper support. The print, just before transferring, is trimmed to the desired size and wetted, and coated with the above gelatine solution and placed face down on the coated side of the drawing paper and left to dry, when it may be separated with perhaps a little assistance, leaving the print on the drawing paper. Any of the colors may be done in this way, but the sepia is particularly beautiful, resembling the much-admired etching. When these various hints and ideas have been carried out, you will agree with me in saying that carbon printing is something more than the ordinary photographic printing, and that it takes photography in one hand and art in the other, all the while maintaining its position among the finest of arts.

#### RAILROAD PHOTOGRAPHY.\*

WM. H. RAU.

PHOTOGRAPHY has been very largely used by great railroad companies for years, and many fine pictures have resulted by the employment of skilled operators for this work. The pictures thus produced are usually large, and serve as advertising mediums; the officials realizing the fact that the public is attracted by pictures. Each road has its peculiar features to illustrate, therefore my remarks will apply specially to those over which I have traveled with special facilities. This class of work requires quick judgment and considerable experience in handling men, as well as outfits, and means real hard labor; everything must be done quickly in order to avoid accidents, and to make a good showing in results for the amount of energy and money expended. When I undertook the task of going over the main line of the Pennsylvania Railroad, I felt that I had a great undertaking before me, as this is the greatest highway to the West, and immense numbers of trains are constantly running. directly under the care of the Passenger Department, whose advertising staff is headed by Col. F. N. Barksdale, whose generous assistance and unbounded faith in the enterprise helped success. An order was given by the General Manager, addressed to all Superintendents of Divisions, instructing them to place at my disposal an engine and crew whenever necessary, and to attach my car to such trains as would move me from place to place as I directed. I never had to show this order, as the Superintendents had all been instructed, and were prepared for me on my arrival on their divisions. I was instructed when I began my work to select views as much as possible on the main line of the road, and to illustrate special points of interest, such as the Horseshoe Curve, Packsaddle, Allegrippus, and others, and also to show, whenever practicable, the fine roadbed, four track system, track tanks, block towers, safety signals, etc., which I did on large plates, mostly 18 x 22, and with a panoramic camera, on films measuring 18 x 471/2 inches. To successfully carry out my instructions I was given the use of a car specially fitted for this pur-

<sup>\*</sup> Read before the Photographic Society of Philadelphia, February 10th, 1897.

pose, in which Mr. T. N. Ely, Chief of Motive Power, took a special interest, and gave many useful suggestions in regard to ventilation of dark room, safety brakes, storage and equipment of dark room. In this dark room are kept the lenses and exposed plates, as well as films, both exposed and unexposed.



SPECIAL PHOTOGRAPHIC CAR, L. V. R. R. WM. H. RAU, IHILADELPHIA.

To all appearance from the outside, car 1382, save an elevated platform on the top and the name, "Photographic Car, Pennsylvania Railroad," is identical with the regulation coach. This elevation is half a foot high and covers an area of some six feet square; it is especially constructed for supporting the instruments and cameras, where a commanding view is desired, at

points where a foot or tripod hold could not be found on the mountain's steep side.

The forward part of the car for some twenty feet is furnished and decorated with the exclusive end in view of promoting the comfortable living of the operator and his assistant, furnished as it is with comfortable parlor chairs and a commodious desk, well lighted. The walls are adorned with road-schedules and maps, framed photographs and prints, ranging from the views along the line of the railroad to points in South America and Europe. Two modern folding plush sofa berths extend their tempting softness after a hard day's mental and physical work, and add a decidedly finished appearance when made up into sofa seats during the day. In case of necessity, should a stop be compelled over night at a way station, a supply of cots can be brought into requisition for use of conductor, engineer, and crew, but this was not likely to happen any more than a call for the use of the cooking stove and utensils, for the car is a "personally conducted" one, and, running on the schedule of a special train, manages to stop over night where the hotels have a table record.

The dark room is in the centre of the car, running for a distance of twelve feet in length and five feet in width, equipped with ruby and orange windows, negative racks and all developing facilities, together with a tank holding a three-hundred-gallon water supply.

The system of perfect ventilation, without allowing light to penetrate the dark walls and ceiling of this apartment, was accomplished by a four-inch opening where the side walls met the floor, and built out from this was a false side running to the roof and angled to an opening in the car, thus allowing a free passage of air, but not a ray of light.

Every precaution was taken for the careful transport of the valuable plates, and the rear portion of the car was devoted to the trunks, built and padded for carrying the outfits.

My first plan was to use films entirely, but I found I could not rely on having them evenly coated in large sizes, therefore I adopted Carbutt's Orthochromatic Plates, which were entirely satisfactory. For the panoramic views I used films, these being necessary, owing to the peculiar construction of the camera, of which I will speak again. I had with me three complete out-fits—a  $6\frac{1}{2} \times 8\frac{1}{2}$ , an  $18 \times 22$ , and the Panoramic. The latter two were carefully packed in trunks in order to ship them as baggage when it was not desired to take the car, as I made a number of trips away from the road, either by coach or wagon.

While operating in the mountains between Altoona and Pittsburg, I was given the use of a passenger engine, and a crew for



ON THE BLUE JUNIATA, PENNA R. R. W. H. RAU, PHILADELPHIA.

my car, consisting of a fireman, conductor and brakeman, and an extra assistant for carrying purposes; in addition to this I always had my own assistant with me. I would generally start in the early morning, and follow an accommodation train, placing myself on the platform to get a view fore and aft. When approaching what seemed a favorable location I would signal to slow, and perhaps stop. A quick survey was made, and if a favor-

able decision was reached the outfit was hurried out and a picture made. It was sometimes necessary to unload the outfits and run the train away, to allow other trains to pass. In this way I would expose from 6 to 24 plates each good day. A record was made of each plate at the time of exposure, and the correct title of the view was noted, and each night when they were packed, a slip containing this was placed in each box of six. After remaining out a week or ten days I came back to Philadelphia and developed—in this way I could repeat an important view if necessary. Working along in this way I did the main line from New York to Pittsburg, also going over some of the principal branches. It was necessary sometimes to build an elevated platform, in order to secure a foreground or get a view. This was especially the case at Cresson and the Horseshoe Curve, the latter being the show piece on the line, and never having been successfully made. I had built a special camera, which embraced an angle of nearly 170 degrees, the latter being necessary, owing to the nature of the view and natural surroundings of it The principle of this instrument was an old one, but had not been successfully applied until a rapid gelatine emulsion, coated on either paper or celluloid, was made use of. M. Carey Lea, in his Manual of Photography, published in 1870, refers to a description of such a camera—published many years before. Panoramic cameras were advertised as being made in Paris, but the angle embraced would not cover the number of degrees required. I therefore undertook the A crude model of wood was first made and building of one. shaped in a half a circle, placing a Ross 15-in. portable lens in the centre of a revolving board in front. The rounded half back was covered with tissue paper, and an extension was made of cardboard from the lens. A handle on the top outside was attached to the board in front, in order to swing it. I was convinced it would work, and was favored with the services of a friend who drew the working plans. These were taken to a well-known maker of cameras in New York, who declined to undertake the construction of it. The same friend agreed to superintend the building, and a number of unsuccessful attempts at flexible holders were made. I finally had the holders made of brass and the

slides of celluloid. Quite a number of experiments were necessary before an even exposure was accomplished, but I continued this expensive practice until I succeeded. The greatest trouble in this class of work is difficulty in getting evenly coated films, the celluloid buckling while being coated, and allowing the gelatine to settle in pools. Owing to the waste thus produced the



MUSCONETCONG, N. J., L. V. R. R. W. H. RAU, PHILADELPHIA.

cost is necessarily high. My camera was specially built to make large pictures, of subjects embracing a wide angle, and within narrow limits. It is not so satisfactory in general landscape work, as only the one lens, to which it is adapted, can be used on it. It has, however, served me very well in making certain great bridges in the South and West, and again at Niagara Falls. My work on the Pennsylvania Railroad lasted from June until Octo-

ber, during which time I covered the line from New York to Pittsburg. Just previous to the World's Fair the same Company decided to display, in their exhibition building at Chicago, pictures of the industries along the line, also all terminals and freight stations and bridges. This was a great undertaking, but having had experience by this time in Railroad matters, I did not feel the same apprehension I did on the first venture. A similar car was fitted up and the start made from New York. Together with two assistants, both competent to handle cameras, we covered the entire system, with nearly all the branches, to St. Louis and The plan of operation was different, as in most cases we located the car as conveniently as possible, and operated in various directions, coming back to the central point and continuing west-some days including a great many towns and cities. This work was begun in April, 1893, and in July a set of pictures was placed in the building in Chicago. A large number of these negatives were 18 x22, the others,  $6\frac{1}{2}$  x  $8\frac{1}{2}$ , enlargements being made from the latter.

In 1895, Mr. Chas. S. Lee, General Passenger Agent of the Lehigh Valley Railroad, awarded me the contract to photograph the scenery of that line. Mr. Lee fully knows the value of showing the beauties of the scenery on the line of a road, and was exceptionally liberal in equipping a car for me. The same general design for a car before mentioned was adopted, and if anything the comfort was greater, and the same methods were pursued. The platform on top of the car ran from end to end. My trip began at New York and ended at Niagara Falls, where I was specially fortunate in having fine weather. Of the resulting pictures the choice of course centres on but a few, which are used most largely, and examples of which I know have gone well around the world. The Lehigh Valley Company had more than 200 large pictures framed, and secured such places as the Union League Assembly Hall of this city, and similar places in the leading cities on its lines and connections, as far west as Chicago, for exhibiting them. Special invitations were sent to the leading citizens to attend the Exhibition, where an orchestra was in attendance, and representatives of the company were at hand to speak of the special merits of the road.



THE PACKSADDLE PENNA R. R. W. WM. H. RAU, PHILADELPHIA,

## THE NEW PHOTOGRAPHY, OR PHOTOGRAPHING THE INVISIBLE.

BY JOHN CARBUTT.

I ADIES, Gentlemen and Members:

The subject for your consideration this evening is the "New Photography," or "Photographing the Invisible," and before entering on the main part of my subject, I will briefly trace the history of photography, and what it has accomplished in a little over the latter half of the 19th century just closing. While most of the earlier processes of photography are of foreign origin, Americans have been the most prompt to adopt and improve on those methods. And I claim for Philadelphia and her citizens the distinction of having fostered and encouraged the beautiful art of Photography more than any other city in the Union. The Daguerreotype, named after the discoverer, Daguerre, a citizen of France, was first announced to the world in 1839. was the Talbetype, the discovery of Henry Fox Talbot, of England, in 1841, afterwards called the Calotype, and was used mainly in taking landscape views. Next came the Albumen Process, Whipple of Boston, and the Langenheim Brothers of this city were the first to adopt the process in America, that is, of making negatives on glass, and transparencies for the Stereoscope and Magic Lantern. The Langenheim Brothers bought the American patent for the Talbot process, and improved upon it by substituting glass for paper, using albumen as the vehicle to hold the sensitive salts, and called the process "Hyalotype." They were the first to make transparencies on glass for the Stereoscope and Magic Lantern. Robert Hunt, in an article in the Art Journal of April 1st, 1851, on "Improvements in Photography," says: "We have before us a series of these Magic Lantern Slides, the Hyalotypes, and we feel bound to declare that their delicacy and perfection of the details cannot be over-estimated." M. Le Gray was the first to suggest the use of Collodion in photography. but Mr. Scott Archer, of London, was the first to successfully apply it, and in 1851 published a treatise on the making of glass

<sup>\*</sup> Read before the Photographic Society of Philadelphia, March 10, 1897.

positives. In America, where the process was speedily adopted, they were called Ambrotypes. The same chemical process was used in the making of negatives, and continued in use until the advent of the Gelatine Bromide Process. Dr. R. L. Maddox, of London, in 1871 substituted a solution of gelatine for collodion to hold the sensitive salts of silver, gave his formula to the world, and the process was speedily taken up by numerous skilled amateurs in England, and by 1876 the professional photographers of England had, owing to the greater sensitiveness of the gelatine plate, begun to use it in their practice. The first to make a gelatine dry plate in this country, that I have any knowledge of, was Mr. Geo. W. Hewitt, a skilled amateur of this city and member of this Society, and the first dry plate factory in America was established in this city by myself in 1878, and by 1880 the dry plate began to displace the wet collodion process, which has long since ceased to be used in portraiture and landscape photography. In 1885, I introduced the orthochromatic dry plate, the use of which, with suitable color screens, has led to the reproduction in colors of objects in art and nature by the three-color process of printing, with remarkable fidelity. Most of you are of course familiar with the exquisite and truthful representation of nature by Mr. F. E. Ives, a member of this society. I might continue to the end of the time alloted me in relating photographic methods of the past and present, many of which I have to pass unnoticed. It is but a little over a year since Prof. Roentgen gave to the world his great discovery of the X-rays, by which it is now possible to photograph the invisible anatomy of the human body, and on the 27th of January of last year the first Radiograph was taken in America by Prof. Arthur W. Wright, of Yale University, one day after he had read of the Roentgen discovery. In passing thus to the practical consideration of the X-ray, I will not attempt to enter into a description of the scientific aspect of the Roentgen phenomena, that has already been so fully and ably described by Prof. Houston, in his lecture on the eve of October 30th last. Prof. Arthur W. Goodlecture at the Franklin Institute, October 30th, 1896, and by Professor Arthur W. Goodspeed, of the University of Penn-



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### RADIOGRAPH OF HAND.

SHOWING AMPUTATION OF FINGER AND FRAGMENT OF CARTRIDGE-SHELL EMBEDDED FOR EIGHTEEN YEARS, BUT JUST DISCOVERED BY X-RAYS.

NEGATIVE MADE BEFORE THE MEMBERS OF THE PHOTO. SOC., OF PHILA., MARCH 10. 1897, BY JOHN CARBUTT. 80" EXPOSURE ON CARBUTT'S X-RAY PLATES.





sylvania, before this society, who early in February of last year made investigation of the Roentgen phenomena, as did also Professor Pupin, of Columbia College, and Professor W. F. Magie, of Princeton, and others. I at once took an interest in the discovery, and conceived the idea that a specially prepared plate would be required to suit the mysterious X-rays, and on February 11th of last year, at the Maternity Hospital, Prof. Magie exposed the first X-ray plate, the case being that of a burned hand with anchylosis of the fingers, one of Dr. W. W. Keen's patients, and the exposure given was 20 minutes. negative showed full detail of bone structure of the hand. On the same day two of the same kind of plates were exposed by Prof. Goodspeed, at the Physical Laboratory of the University, on objects, time of exposure 21 and 30 minutes respectively, and both proved to be fully exposed; previously exposures to the X-rays had ranged from 60 to 120 minutes. With improved apparatus and further improvements in the X-ray plates, exposures now range from a few seconds to 30 to 60 minutes, depending on the thickness of the part of the body to be radiographed. I will now make an exposure on one of my X-ray plates, simply enclosed in a double envelope, this allows of the object to be radiographed being close to the sensitive plate, the exposure will be 90 seconds, with lower side of tube 12 inches from the plate. I will now ask the President to let me radiograph his hand, the one lacking a finger, which my son will develope, and later can be seen by you. As confirmation of my previous assertion that Philadelphia leads in the application of any new improvement in, or use of photography, I will quote from a work on X-rays, by Edward P. Thompson, M.E.E.E., page 178, where he says: "In the race to excel in this new art, no one, to the author's knowledge has surpassed Prof. Goodspeed, of the University of Pennsylvania, considered jointly from the standpoint of priority, superiority, quantity and variety." Of that you had ocular evidence last fall at the lecture given here, and profusely illustrated by Prof. Goodspeed. The hospitals of Philadelphia and other cities are rapidly installing X-ray apparatus, and the surgeons in charge are making most valuable use of the Roentgen rays in diagnosing cases of

fractured bones and locating foreign substances, and there are instances where the use of the X-rays has been the means of saving life, notably in two cases in this city, where foreign substances had been swallowed and lodged in the œsophagus. In the first case a little girl of five years swallowed a jackstone, and the location of same was revealed by a radiograph taken by Prof. Goodspeed, and the jackstone was successfully removed by Dr. W. H. White, with the speedy recovery of the patient. The second, and most recent, was the location of a small iron staple in a man's throat, that had formed one of the ingredients of a mince pie he had partaken of. Radiographed by Dr. Max Stern, of the Polyclinic Hospital, and successfully removed by Dr. Bliss. In Orthopædic surgery, the use of the X-ray apparatus is of great value in diagnosing the malformation of the bones. The following hospitals in Philadelphia have X-ray installation: the Polyclinic, in charge of Dr. Max J. Stern; the Jefferson Medical College, in charge of Dr. M. W. Coplin; the Pepper Clinical Laboratory, in charge of Dr. Chas. L. Leonard; the Medico-Chirurgical, in charge of Dr. E. La Place, and the Episcopal Hospital. The apparatus for the successful production of radiograph consists of, first, an Induction coil, second a Crookes' tube, third an electric current, which may be obtained from a dip battery having six or more cells coupled in series, or from a 110-volt incandescent current, controlled by a Rheostat, or third, and preferably, a storage battery. This outfit I have here is of the modern type, the Induction coil being capable of giving an 8-inch spark in air and excited by the current from two chloride accumulater storage batteries of 16 volts, the large Leyden jar is used as a safety valve, by allowing one of the conducting wires from the coil to pass the current through it, and make a small spark gap, so that in case of a sudden increase of the current, the jar would act as a condenser and prevent injury to the Crookes' tube. The condenser of this coil has large capacity, and divided into ten divisions, controlled by a fan-shaped contact, and was made to order for me by C. F. Splitdorf, of New York. It has an improved vibrator that allows the use of a tube of low vacuum to one requiring fully a 7-inch spark to force the current

through, and the vibration can be adjusted to give a moderately fast or very fast make and break contact. Of the Crookes' tubes we no longer have to look to foreign makers for a supply, as again American genius shows its capabilities in supplying quickly, and of the best, there being seven or more makers of Crookes' tubes in the United States. I have here samples of several makers', each differing in construction, and all capable of generating a good quality of X-rays. The Crookes' tube, I may here say, is the most essential part of the outfit, and requires the greatest care in its use. In procuring a new tube I advise that its vacuum should be for not more than half the spark-capacity of the coil it is to be used upon. For instance, if you are using a 6-inch spark coil, the tube should readily fluoresce with a three or three and a half inch spark, for after being used a few times it will be noticed that the vacuum has gone higher and more tension is required on the vibrator to produce the full amount of fluorescence and good X-rays. There are various devices added to the Crookes' tubes for the purpose of lowering the vacuum when it gets too high for the current to flow through the tube readily, of these I have here three examples. This one, made by the Edison Lamp Co., of Harrison, N. J., has an auxiliary tube containing at the end a substance that when gently warmed gives off vapor that lowers the vacuum and enables the current to again pass at the voltage the coil is supposed to be used at. This one, made by Emil Greiner, of New York, has a small incandescent lamp enclosed in the stem, which, when connected to a four or six volt battery and allowed to burn for a minute or two, will lower the vacuum when too high. This tube I will use later in illuminating the fluorescent screen. This one was made by Queen & Co., of this city, and has also an auxiliary tube containing a chemical salt that when heated lowers the vacuum. A tube without these adjuncts for lowering the vacuum may for a long time be made to give off good X-rays by carefully heating the cathode end with a spirit or gas flame. In using the tube it is well not to let the anode become heated beyond a small, cherry red space not exceeding a quarter of an inch, for it is the heating of the anode that so quickly raises the vacuum, and the distance at which the lower side of the tube should be from the sensitive plate, very materially affects the time of exposure and the result. Eight inches to ten or twelve is near enough for a hand, the shorter for a small hand and the latter for hand and wrist or forearm, bearing in mind that the exposure must be increased as the square of the distance. For instance, an exposure with the tube six inches from the plate, we will give say, 30 seconds; at 12 inches, 120 seconds; at 18 inches, 270 seconds would be about right. It is with diffidence that I speak of the photographic plate to be used for X-ray work as I am personally and commercially interested in its production, therefore I will speak generally of what I consider, after much study and experience, the dry plate suited to the use in Radiography. It should be of medium sensitiveness, have a good body of emulsion, be capable of absorbing the X-rays, thereby giving more detail and perspective to the bones. For developer, one capable searching out detail and and at the same time capable of giving density, and not apt to stain the plate by long development. Pyro I would exclude for this class of work. eikonogen with hydrochinone mixed is good, or used separately. I may say, however, that the developer most generally used with my X-ray plates, is the J. C. Tabloids I put up. The plates should during development be covered over, and development continued for six to ten minutes, until if possible a trace of the image can be seen on the back. After developing and well rinsing off, the plate should remain in the fixing bath for not less than 20 minutes, and all solutions should not be used below 60 degrees Fahr. I will now have shown on the screen a few examples of Radiography, and the first is that of an infant four days old, taken after death, showing the lack of ossification of the joints; 2 and 3, the mummy hand and foot of an Egyptian princess, radiographed 3,500 years after death; 4, a rat after being killed by a terrier; 5, a crab; 6, a Conger Eel; 7, Quail; 8, hand of lady musician; 9, interior dislocation of radius; 10, comminuted fracture of both bones of forearm; 11, tumor on hand; 12, an artificial spectrum made up of strips of colored screens, such as I make for use in photographing paintings. I show this slide to demonstrate that while the colors are transmitted and shown in all their brilliancy

on the screen by the light received from the same source that energizes the induction coil and produces the X-rays, when I place the same artificial spectrum behind the fluorescent screen, you will observe that the X-rays absorb all the colors of the spectrum, and no color sensation reaches the eye any more than the piece of plain glass above the artificial spectrum. This I believe to be the first time such phenomena have been demonstrated in public, and until Dr. Roentgen or another able scientist proves otherwise I shall continue to believe that the X-rays are the ultraultra-violet. This screen I prepared, to show to the audience the hand and arm, and will now have the lights extinguished the better to observe the effect, with which I close my lecture, and thank you for your patient attention.

#### COMMUNICATION.

To the Editor :-

Seeing an account of X-rays in your journal of February, I thought perhaps a similar experience might prove of interest. I was called up at 10.30 p.m. to make an X-ray of a man's foot, for locating a needle. I exposed plate four minutes, in five minutes I had it developed and fixed; then made another plate through the foot, lengthwise, exposing it ten minutes, five minutes after I had it developed and fixed; both plates being carried out to Doctor Van Lennep, who then spent about five minutes freezing the heel of the patient, then gave him one cut of the knife and removed the needle with a pair of pliers. His part of the operation occupying, besides time of freezing, about three minutes. As a matter of time the whole performance will be hard to beat, and we are not required to go to Illinois to illustrate such work.

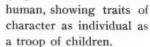
Yours, Jas. L. Wood.

The broad face in the moon is familiar to most of us, and several astronomers have fancied they could see other faces in portions of the lunar surface magnified in the telescope. Dominic Cassini, astronomer to Louis XIV., for example, discovered the profile of a beautiful woman with flowing hair in Cape Heraclides on the Mare Imbrium; while, curious to tell, Schroeter, another observer, found the likeness of an ugly man in the same spot. A photograph of the Sagittarius region of the Milky Way, by Mr. Barnard, contains within the circle a shadowy visage, which the observer is requested to discover for himself. It is something of the Dickens type, and in more classical and superstitious days it might have been regarded as the apotheosis of the illustrious novelist. The eyes are formed by two dark areas with whiter specks, and the lock of hair on the right hand by a stream of stars. The face is recognizable in other photographs of this region.—Casself's Family Magazine.

### FLOWER PORTRAITURE.\*

MRS. CHARLES SCHAEFFER.\*

I HOPE the society will not consider this a voluntary contribution, or that I feel it anything but presumption for so inexperienced a member to undertake to give information to such a body of long experienced photographers. On the contrary, one feels humiliated at knowing so little. But for the sake of doing the little I can, and that I may throw a straw for some new member to grasp, I acquiesced in the request. In flower photography one lays in, as essential apparatus, not only a good camera, lens, and plates, but a large stock of patience. This is one of the chief requisites for flower work or flower portraiture. For, as one studies these treasures of nature, they grow more and more



A calla will stand for hours with all the dignity of a queen, permitting sittings of every description, and bringing forth one good negative after another, while a dainty rose acts as fussily as a foolish child, ten to one showing movement even at 15 to



20 seconds exposure; while maiden-hair fern is simply a bundle of nervous tremors. All my flower work has been done minus a studio, as much other will have to be done, till some day we awake to the glorious realization that the Photographic Society of Philadelphia possesses a sky-light, when I hope many of the difficulties may be overcome. The chief difficulty I find to overcome is depth of focus demanded, which compels the use of a very small diaphragm, this in its turn compelling a long exposure. There lies

<sup>\*</sup> Read before the Photographic Society, January 13th, 1897

all the trouble, for some flowers will sink, and continue to sink, no matter how long they have been posed or kept with greatest care before posing, and dainty heads will bob and tremble as heavy carts go rumbling by, just at the critical moment. The remedies are, patience, more plates, and a greater concentration of light to enable a shorter exposure. Many are the devices for enticing the sun to come in a south window in a general way (or diffused), without shedding a direct light. I have found a large cheval glass of great assistance in giving the soft half tones to the dark side of the faces of my flowers, and should that not completely obliterate the dark lines, a sheet on the floor lights up the lower portions. For a background, a 12 x 12 screen being out of the question in one's sitting-room, I use the suggestion of Mr. Rau, a couple of yards square of cotton cloth, keeping it slowly moving in a circular manner during exposure, thus making a blank background which flowers demand to show their outline. Thus any tint of background can be obtained according to the color of your cloth, black velvet making a very good representation of indefinite depth. Some of you will also distinctly remember (and new workers in the art learn) the arm-ache which accompanies this waving performance when kept up for from 3 to 6 minutes on a dull, rainy day, and will hail with delight, in proportion to the suffering, that sky-light and the screen for background work. Quite an effective result in lighting is also obtained by shutting off the lower half of the window by means of a black cloth, placing the flowers quite under the shadow of the black, and retaining the reflected lights of the cheval or any white surface—a pretty high light outlining the model of the flower with soft half-tones for the body is the result. of our flower work we have been using Seed's Double Coated Isochromatic Films, having chosen them against good advice, because of their light weight and unbreakable qualities in traveling-when most of our work is done. Though many may not consider the result as good as glass, it is a satisfaction to return from one's summer outing with sound negatives and a mind untroubled with shattered glass.

#### CHASSAGNE'S COLOR PROCESS.

CAPT. W. DE W. ABNEY.

The process of color photography, by M. Chassagne, of Paris, which I had the pleasure of seeing demonstrated at King's College some ten days ago, through the kindness of Sir H. T. Wood, is a very remarkable one. I went as a sceptic. The process may be described in a very few lines. In the first place a negative is taken on a gelatine plate, which has been specially prepared. The plate is developed and fixed in the ordinary way, and the image appears of the same character as if taken on a good density-giving plate. A transparency (a positive) is next taken on a similar plate from this negative, or a silver print made on specially prepared albumenized paper, on either of which the color process is worked. The coloring is of a very simple nature. There are three dyes—a crimson-red, a grass-green, and a very good blue, all in solution, and mixed with some other ingredients besides water. There is also what we may call a mordant in the shape of a colorless liquid containing, I should say, albumen and salt.

This last liquid is brushed copiously over the face of the positive (or the silver print), and the blue dye applied a little at a time. If the light be good (and it was stated that the coloring must take place in good daylight), the blue dye rapidly takes hold of those portions of the surface which represents in monochrome what are blues in the original. For instance, a china vase will take the blue tint, and the face or hands a faint amount of the same color. The green dye is applied in the same manner, and the greens in the original make their appearance in the positive, and so with the red. Finally the print or positive presents a picture in colors, underlying which is the dark brown silver image. It appears as if the image took up selectively these three colors; but why it takes them up it is hard to see. I have by me a portrait done in the manner described, and the negative has evidently been retouched with the pencil. It is difficult to understand why a pencil mark should be the cause of selective absorption of the colors, or that a special plate should be necessary. That the success of the process does not depend upon the inventor's manipulation is quite evident, for negatives were taken by Sir H. T. Wood, quite independently of him, but, of course, on prepared plates given him for the purpose, and from these he made positives. These last, when treated with the coloring matter, gave the correct colors of the original. Still I am somewhat sceptical-I believe it is my failing to be so-and I shall not be satisfied till I get the plates that have been promised me by the inventor (M. Chassagne), and taken negatives of certain test objects which will be unknown to the inventor. If he can reproduce their colors, it will have to be without any reference to the amounts of silver which ordinarily indicate the color in the original, for in the negatives sent every color will be represented by approximately an equal density. Some few years ago a powder process was seen by Mr. C. V. Boys, in which three colored powders selectively adhered to the surface of paper. The paper was prepared with some glutinous substance and bichromate of potash, and which remained more or less tacky according to the amount of exposure to light it received. These three powders, a red, a green, and a blue, I believe, if applied in a certain order, adhered to the print, and gave approximately correct results of color, though no special negative was required. Whether this new process now described depends on any similar grounds, it is hard to say at present.

The point that strikes me in the latest process is that it is only from a specially prepared negative that a print suitable for coloring can be made. Were it the negative which took up the color, one might understand the matter better. To me at present the process as stated is a mystery; but, if it does all that is claimed for it, it must be a great success, and the theory of it will have to be investigated in a thoroughly scientific manner. At present the details are a secret; but I am given to understand that the seal of secrecy will be withdrawn before long.—Nature.

The road to art is proverbially a long one but is often made longer than it need be by injudicious instruction as well as by the mistakes of the young artists themselves. There are a great many who have a natural inclination to art, but who, not having had a special art training, long for guidance into its ways of pleasantness. Reynolds said, "Nothing is denied to well-directed industry, "hence the necessity of proper instruction to those who are beginning to study art, and the importance of good directors and sound dicta, which the books and periodicals devoted to art teachings should supply. A little periodical comes to us from the Art Publishing Co., of 411 Pearl Street, entitled, "Art in the Class-Room, the Workshop and the Home." While the design is not to supplant the teacher, but rather to aid him in his work, it furnishes a student removed by location from the personal influence of an instructor, efficient The papers in the March number are well written and on a variety of interesting topics, suggestive and stimulating. The price is within the reach of all-\$1.00 a year.

Fluorescent Screens.—Dr. van Melckebeke, of Antwerp, has introduced a new fluorescing material, which is considered superior to potassium platino-cyanide, for use in connection with the Roentgen rays. It is composed of oxyfluoride of uranium and ammonium.

#### OUR ILLUSTRATIONS.

Frontispiece—The prize picture selected by the Pennsylvania State Photographic Association is the work of Mr. J. B. Schriever, of Emporium, Pa. Everyone must applaud the taste and judgment of the jury who made the selection while enjoying the beautiful portrait of the artist. The simplicity of the lines and the truth and power of the relative tones unite in placing this picture in a prominent place in photographic art. There is no trick of illumination that we can discover to give supremacy to this head which nevertheless rivets our attention at the first glance, and to which we return again and again, impressed by the thoughtfulness and serenity mirrored in the countenance, the charm and grace of pose and the beauty and naturalness of expression.

To represent in painting a portrait in a devotional attitude demands the exercise of much tact to make the pose consistent with the temperament and character of the individual portrayed. It is the manner and look of the sitter which either interest and delight or offend and disgust us; and in a photographic portrait, by reason or the intense realism inseparable from the art, the demand for the exercise of taste and judgment coupled with artistic perception is doubly necessary, and we accordingly esteem these qualities in the photographer of this picture.

That the photograph has high technical qualities goes without saying, but we cannot refrain from giving a meed of praise to the makers of the fine half-tone engraving that so admirably sets forth the excellence of the print. It is the work of the Electro-Tint Engraving Co., of Philadelphia.

The picture suggests the beautiful sonnet of Wordsworth-

#### MADONNA.

"Mother! whose virgin bosom was uncrost
With the least shade of thought to sin allied;
Woman! above all women glorified,
Our tainted nature's solitary boast;
Purer than foam on central ocean tost;
Brighter than eastern skies at daybreak strewn
With fancied roses, than the unblemished moon
Before her wane begins on heaven's blue coast;
Thy image falls to earth. Yet some I ween,
Not unforgiven the suppliant knee might bend,
As to a visible power, in which did blend
All that was mixed and reconciled in thee
Of mother's love with maiden purity,
Of high with low, celestial with terrene!"

Spirit of the Journals.—The British Journal of Photography for February 12th has an excellent editorial directly bearing on the question, "What is Photography in Natural Colors?" It is regarded truly as one of the most severe problems which are given to photography to solve, but the seductive attractiveness of the subject which is a great incentive to the investigator, the world-wide fame, and the pecuniary reward it carries with it, animate his flagging energies to overcome the almost insuperable difficulties to a successful achievement.

The editor properly asks, What is a photograph in natural colors? Justly realizing the difficulty of a comprehensive definition, showing how the doctors themselves disagree.

He supposes the acceptance of a definition that heliochromy is the direct production in the camera of a transcript from nature, and declares that so regarded we are obliged to confess that "we are as far from the ideal as ever we were." "The silver haloids that are impressed by light cannot yet be made to exercise the property of yielding up colored images by any form of development; neither has any known chemical or physical treatment made those haloids color sensitive in the sense we here specially mean; while as regards direct colors on positive printing surfaces, fifty years of experiment have produced virtually no results worthy of consideration. Thus in what might be termed direct photography in natural colors practically nothing has been done."

The editor echoes the voice of almost every one when he says that the general public, the great majority of photographers, and "not a few scientific men," will be only satisfied with such a solution, a consumation which is extremely improbable. The editor of the *British Journal* refers much of the apathy with which "the very beautiful work in color that has so far been produced" has been received, to these foregoing conclusions. What has been accomplished by the Lippman-Lumière interference method "is not only not strictly photographs in natural colors, but except when viewed or projected at a certain angle of incidence, are practically of an entirely indefinable order—are neither negative nor positive."

The editor concludes his altogether just and temperate views of the subject by saying that "the process has not yet got out of its swadding clothes, and that it presages but little hope at present that it will develop into a workable method to fulfil popular demands.

The editor also expresses his views on three-color work, and declares that though it theoretically approaches somewhat near the requirements of the case, it is not at present of real practical utility. "The possibilities of the process are great for the purposes of reproduction of very many subjects in colors, but the nature and difficulties of the process deprive the individual photographer of the opportunity of employing it.

The etched block and the typographic printing-press appear to swamp the purely photographic parts of the process, and incline many to refuse to consider it, however worked, as a method of photography in natural colors."

The editor, we are pleased to see, has the highest praise for the beautiful results in the three-color process on glass, as so successfully studied and perfected by Mr. Ives; and we agree with him, too, in his opinion that it is not available for many purposes, and that it is based upon physical principles, and is not really a solution of the problem of color photography.

In connection with these remarks by the editor of the *British Journal*, we subjoin the views of a writer in the Philadelphia *Record*, which may serve as a commentary on them.

This writer deplores the fact that despite the labor of eminent men of science we know so little of the rationale of the various photographic phenomena; that the problems are attacked by the deductive rather than the inductive method, a preconceived theory is taken, and the conditions are constrained to a verification of it, rather than a general principle being evolved from crucial experiments.

After giving a brief history of the investigations in color photography from its inception, the writer concludes with the opinion that even should complete success attend the labors of the heliochromists, the results would by no means satisfy the artistic sense of the beautiful, because the delight in paintings from nature is dependent much upon the effect produced by persistence of vision in the subjugation of the complimentary colors on the retina, which modify the impression received from nature, The color-photograph, the writer declares, would ignore these extra color effects and give the colors in too intense a realism.

At the regular March Monthly Meeting of the Photographic Society of Philadelphia, Mr. John Carbutt gave a very interesting talk on the "Photography of the Invisible." After describing the apparatus and indicating the best methods for utilizing the radiations from the tube, he gave a practical demonstration by radiographing the hand of the President of the Society. The plate was at once developed, and the result was truly a remarkably fine negative, clear, well-defined and with a surprising amount of detail. (A half-tone will be found in one of our pages.) A fragment of steel from an exploded shell was clearly indicated, lodged in the bone of one of the fingers. Mr. Carbutt displayed a number of excellent prints, illustrating fracture and other pathological conditions; the clearness, sharpness and wealth of detail would cause anyone to believe that the negatives had been photographed in a camera. Mr. Carbutt, of course, employs exclusively his own X-ray plates, which are

specially prepared for radiographing. They are undoubtedly rich in silver, and possess an absorptive quality which renders them peculiarly adapted for the X-ray radiations. We can emphatically say that we have never seen radiograph prints which equalled in quality and in the rendering of detail the work exhibited by Mr. Carbutt. Another feature is the neat and very convenient preparation of the plates for instant use. They are enclosed in an envelope impervious to ordinary light so that they can be directly handled or arranged in position without the necessity of being placed in a holder or other device, or requiring a visit to the dark room to refill.

**The** Practical Process Worker, London, has an interesting communication on "Lithographic Color Effects by Photo Zinc Etching," by A. C. Austin. We are indebted to Photography for the paper.

The author presupposes the possession of a considerable amount of artistic ability by the operator for the production of the best results. If the artist has had any experience in lithography the effects produced will go far to deceive the observer in the close approach to stone work.

A given subject can be done in eight or more printings, and for general purposes may compete with any first-class lithographic process.

The first step is the production of a key or guide for laying out the several color plates. This key may be produced by making a drawing directly upon a piece of zinc in lithographic ink, the etcher afterwards rolling up the image and etching it by the usual methods. If a painting or a finished color drawing is to be reproduced, however, it is better to photograph the original by means of an orthochromatic plate, and thus secure all the values in correct scale, and from this plate make a print on smooth surface bromide paper. The artist then traces over this print in outline, bleaches out the photographic image, and returns the drawing to the photographer.

It is advisable to have this first photographic drawing somewhat larger than the original, so that in the final etchings there may be some reduction. The outline etching is generally made the same size as the first photographic drawing. Ross papers are the medium for the remainder of the work, and the selection of texture is made entirely in accordance with the nature of the subject in hand. The outline etching is rolled up with a very light blue ink, and four or more prints are made upon the different grades of the Ross paper.

These prints furnish the artist all the drawing for each color absolutely alike as to size. The different portions representing the different colors and their blendings are now worked over by the artist, who uses lithographic Conté crayons and black ink to represent the different intensities. This is the part requiring the skill of a trained artist, but to such a person

the work is quite easy and quite like working on the stone. If rightly done, the remaining operations are very simple, requiring only the services of a careful etcher.

The negatives from the crayoned drawings should be made through a prism or by means of a mirror, so that there may be no necessity for turning the film, which would be sure to occasion misfitting in the etched plates. The negative and the etchings must be done carefully, in order to retain all that is in the original drawing, and after the routing it is quite likely that some of the edges will require hand tooling, in order to "soften" them.

The selection of the colors and the order of printing depend wholly upon the nature of the subject, and cannot be described here, but an ordinary pressman, under the guidance of the artist, can turn out a finished print that cannot help but be satisfactory.

Intensifier.—The method of intensification, either first introduced or invented by the late distinguished Dr. Liesegang, of Düsseldorf, Germany, is a most excellent one, and ought to be as well known in this country as it is in Germany.

I cannot at present lay hands on the exact formula, but it is very nearly constituted as follows. At least the following works admirably in my hands:

A.—Sulphate	copper,							 	۰				v	5	grammes.
Bromide	potassiu	m, .				9				a			6	5	cc.m.
Water, .			 		0 0							 		200	cc.m.
D Misses	-11													6	

B.—Nitrate silver, 6 grammes.

Water, 120 cc.m.

Wash the negative, so as to remove all hypo; place it in Solution A until thoroughly bleached. If only slight intensification is desired, superficial bleaching will suffice; but if great intensity is wished for, let the bleaching operation go through the film to the back of the plate.

Wash for about five minutes in running water; immerse in the nitrate of silver solution until the plate is thoroughly blackened. Then wash for half an hour or more. The dried surface of the film is better adapted to the process than when the film is saturated with water. The operation is also best performed in subdued light.—Adolph Reuss.

(The above intensifier is an excellent one, but it is by no means new; however, the editor does not know whether Liesegang is the inventor or not.)

**The** intensifier recommended by Mr. Chapman Jones (treating the negative with bichloride of mercury until the image is bleached and then following with ferrous oxalate) is discussed by Capt. Abney in one of the recent numbers of *Photography*. Capt. Abney emphasizes the great necessity of a thorough elimination of the hypo from the film before treat-

ment and the importance, also, of washing thoroughly at every stage. The great trouble encountered in this really excellent method of intensification lies with the danger of encountering lime to the formation of oxalate of lime. The mercury can readily be removed by the washing, and most thoroughly by bathing in solution of chloride of ammonia or common sait. The traces of hypo are removed by treatment with weak solution of perchloride of iron, after thoroughly washing, as published in the American Journal of Photography some years ago. So the principle danger really lies in the formation of the oxalate of lime from hard waters, which Capt. Abney says, will disfigure the negative with marble-like markings. Repeated soakings in soft, pure (boiled or distilled) water, it is said, will prevent these markings. Washing under the tap should not be done until after the soakings. When all the yellow color of the oxalate has been removed, it may then be placed under the tap without danger. Both the paper by Mr. Chapman in the Journal of the the Royal Photographic Society, and Capt. Abney's valuable suggestion should be read.

Perhaps one of the best of the numerous class of sham Latin inscriptions was one which appeared some time ago in a Dublin paper. It was antique "Latin," as follows:

"'I sabilli hæres ago, fortibus es in aro.'

"' Nosces Mari thæbe trux, votis innem . . . pes an dux.'"

This purported to have been found near the site of a church dedicated to "the saint known to the old chroniclers as Uncatus Ambulans."

The "Latin" inscription was in reality an absurd rhyme:

"'I say, Billy! here's a go, forty 'buses in a row.'

"' No,' says Mary, 'they be trucks; what is in 'em?—peas and ducks."

—Lippincott's Magazine.

Another big addition to the Eastman Kodak Co.'s plant. In spite of the depression of trade Eastman Kodak Co., during 1896, employed more than 900 men and women in its camera department alone, running its factory 18 hours a day for several months, and turning out hundreds of thousands of cameras. But even this wonderful capacity has proven inadequate, and work is now progressing rapidly on an addition to the factory which will make room for 600 additional hands. The present factory was completed in 1893, and is 68 x 130 feet with six stories and a basement, while the addition will be of the same height and will be 117 x 100 feet. Like the original building, of which it will be a part, it will be built on the mill construction plan and will be equipped with every device for turning out high grade goods at a low cost. There will be a fire wall dividing the building, and it will be equipped with two complete power plants; will have four elevators, two for freight and two fast passenger

elevators such as are used in modern office buildings; will be heated by the blower system, and will double the capacity of what is already the largest and most complete camera factory in the world.

The contract for the new building calls for its completion by May 15th, and no doubt every square foot of the additional space will be needed to keep up with the steadily growing demand for the Eastman goods, as that company is just introducing a new camera, the No. 4 Cartridge Kodak, which will certainly rival in popularity the Pocket Kodak, as it adapts the Film Cartridge System to a high grade folding camera with pneumatic shutter, rising and falling front, adaptability to use with glass plates, and many other features that are dear to the heart of every skilled amateur.

Photographing Coins.-Recently I was asked to photograph a prize medal for the purpose of furnishing prints from which to make half-tone blocks. I proceeded in the usual way, using a reflector to throw the light directly on the face, and obtained what I thought a satisfactory print. But the medalist was not at all pleased with my production, and claimed that if the print from the half-tone block should look like it it would not be a true reproduction of his medal. He wanted it to look like the coins in the numismatic books, and I confess I would too. So I took back the medal, and tried all sorts of ways, none of which gave prints up to his beau ideal. I called on a friend, who I knew had photographed a collection of coins for a publication, which had come out very satisfactorily, resembling very closely engravings.

After teasing me a little while he told me that his photographs were not taken from the medals at all, and that mine was quite as good as one might expect of photography.

His photographs were taken directly from plaster casts, which were slightly rubbed over with a tinted powder to represent a good photo-

graphic tone.

He told me to induce my customer to have an electrotype made of his medal, and to use the electrotype to make a plaster cast and photograph this, using a tint of color to represent gold in the copy, and to make use of a rather narrow side light, illuminating at right angles the coin. After some demur, the medalist consented, and the photograph was a beauty. and I was in possession of a wrinkle which I give to my fellow-photographers to help them out of a stick.-Wunderlich.

A German biologist has discovered that the two sides of the human face are never alike. In two out of five the eyes are out of line. In seven people out of ten one eye is stronger than the other. The right ear is almost always higher than the left. Yet photography must set this all right to please the sitter.

## ADVERTISEMENTS.

BARGAIN LIST.—APRIL, 1897.	I—Student Camera, complete \$1 50 I—14x17 Ideal Camera, holder, tripod, Orthoscope lens and
PORTRAIT CAMERAS.	case, 90 00
[For Lenses see Special List,]	Without lens, 40 00
1-5x7 Victoria Camera, \$ 8 00 1-11x14 Scovill Port. Camera, Bonanza holder, 35 00	HAND CAMERAS.
Benster holder, 30 00	1—5x7 Folding Premo, R R lens, 24 00 1—4x5 Waterbury Detective Cam-
1—11x14 Portrait Camera, with	era, 3 holders, 8 oo
8x10 attachment, 55 00 1-14x17 D. S. B. Portrait Camera, 40 00	1-No. 1 Kodak, 5 00
1—5x8 Wet Plate Stereo. Camera,	1-5x7 Folding Kodak, new, . 45 00
3 holders, 20 00	1-4x5 Turnover Detective, new, 10 00
,	1-4x5 Climax Detective, new, to oo
VIEW CAMERAS.	1-6½ x8½ Premo Sr, no lens. 28 00
1- 8x10 Scovill D. S. View Cam-	
era, 6 holders, tripod, R. R.	ACCESSORIES.
lens, 28 60	1-4x5 Roll Holder for Hawk Eye 5 00
Same without lens 18 00	6-Scovill Light-weight Holders,
1—22x28 American Opt. Co. View	each, 70
Camera, 22x28 Français lens, 150 00	I—Photoscript, 2 00
era, 4 holders, tripod, Eury-	1—Wood Stereo Exposer, 50
scope lens. Prosch shutter, . 100 00	3—Cross Collodion Filters, each 1 00 1—11x14 Glass Bath, 2 00
1-5x8 Blair Lucidograph, 4 00	2—12x15 Glass Baths, each 3 00
1-4x5 New Model, 6 00	25-6½ x8½ Printing Frames, each 30
1-8x10 Blair, Rev. Back, good	2—10x12 " " " 50
order, 18 00	2—14x17 " " 1 25
1-5x7 Universal Camera, 3 extra	I—Eastman 4 fold tripod, 4 00
holders, tripod, good as new, 24 00	I—Tall Head Rest, 1 50
1-5x8 Wet Plate Stereo Camera, 1 pair Darlot lenses, 1 5x8	1—Pair large Beam Scales, 14 in., 2 00
Darlot lenses, 10 00	I—McKee Embossing Press 8 oc I—4¼ x5½ Eastman Roll Holder, 2 75
1-4 x 5 New Model Outfit, 6 50	6-5x8 Scovill Film Holders, 6 00
1-6½ x8½ Novelette Camera, two	1-6x8 Cloud Vignetting Ground, 3 00
(2) extra Holders, Beck R, R.	1-906, 8x14, Ground 8 20
Lens, Canvas Case, in good	1-5x6 Burlap Ground 3 00
condition. Cost \$107.00. Will	1-Anthony's Electric Retoucher, 15 00
sell for 60 00 1—4x5 New Model Imp. Camera,	31/4 x41/4 Washing Boxes, each, 50
	2—Large Oak Show Frames, each 5 00
Wray lens, 6 extra holders, . 34 00 1-5x8 Genessee Outfit, 3 extra	I—Cooper Enlarging Bromide
holders 13 00	Lantern, 5½ in. condenser . 25 00 1—15 in. Improved Eureka Bur-
6-% Scovill light-weight film	nisher 25 00
holders, each 1 00	1-Acme Print Trimmer, new, . 9 50
1—Takiv Magazine Camera, 2 50	1-Baldwin Print Cutter, new, . 10 00
1-Peep-a-Boo Camera, 2 50	Lot of Picture Mats. Write for
1-5x8 Blair Camera, with 61/2 x81/2	particulars.
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Co.'s View Camera, 15 00	I-Wall Accessory, 4 00
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I—Osborne's Rock Accessory. \$8 co I—Osborne's Pillar Accessory . 8 co Lot of second-hand backgrounds, 8xIo and 6x8, \$3.00 to \$6.00; write for particulars. Peerless Varnish Pots, each 40 I—41x51/2 Negative Box 35	I—4x5 Bausch & Lomb Shutter, \$8 00 I—8 in. Condensing Lens, 4 00 I—4x5 Gundlach R. R. Star, 6 50 I—Krugman's Pat. Cabinet Lens, I 8 00 I—IIXI4 Francais Lens, 40 00 I Set 1/2 size Lenses 9 00 I—1/2 size Voigtlander Portrait . 20 00
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1—Card-size Burnisher 3 00	I—‡ Voigtlander Lens, 9 00 I—I6x20 Darlot W. A 35 00
Album, 9 00	1—16×20 Darlot W. A 35 oc 1—6½ x8½ Gundlach and Shutter, 45 oc
1—Thornton-Pickard T. & I. Shut-	1—Extra 4x4 Harrison Portrait. 20 00
ter, 4 00	ı—¼ H B and H Lens, 3 oo
1-Iron Centre Camera Stand, . 2 50	1-1/2-Size Dallmeyer lens for
I -No. 5 Low Shutter, 2 50	cabinets, 50 oc
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1-IIXI4 Rapid Rect. Lens, 20 00	1-10x12 Blair Orthographic, 18 ox
1-16q20 Rapid Rect. Lens, 30 00	1-5x8 Wide Angle Lens, 5 oc
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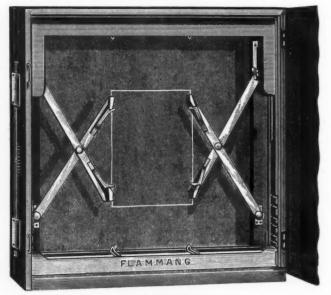
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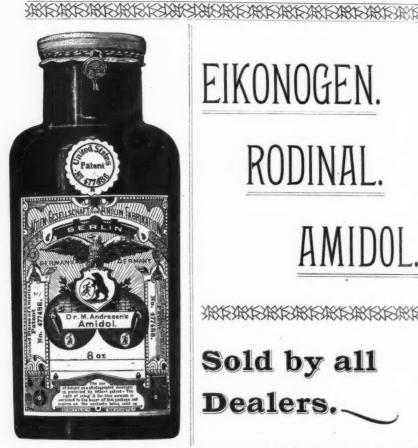


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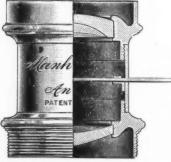
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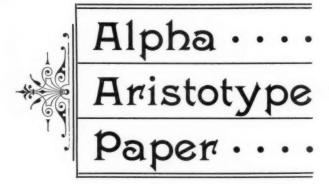
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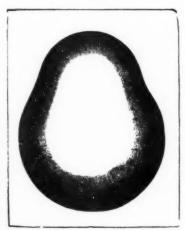
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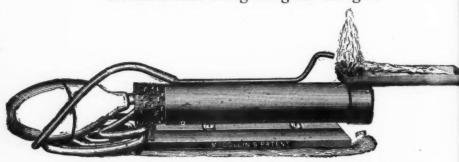
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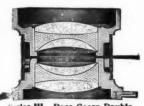
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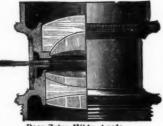
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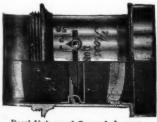
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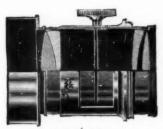
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